Dismantling the Divide Between Indigenous and Scientific Knowledge

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ABSTRACT

In the past few years scholarly discussions have characterized indigenous knowledge as a significant resource for development. This article interrogates the concept of indigenous knowledge and the strategies its advocates present to promote development. The article suggests that both the concept of indigenous knowledge, and its role in development, are problematic issues as currently conceptualized. To productively engage indigenous knowledge in development, we must go beyond the dichotomy of indigenous vs. scientific, and work towards greater autonomy for 'indigenous' peoples.

INTRODUCTION

In the decades since the second world war the rhetoric of development has lumbered through several stages, focusing on economic growth, growth with equity, basic needs, participatory development and, now, sustainable development (Bates, 1988; Black, 1993; Daly, 1991; Hobart, 1993; Redclift, 1987; Watts, 1993; Wilber, 1984). One of the more glamorous phrases that has now begun to colonize the lexicon of development practitioners and theorists alike is *indigenous knowledge*. Where 'western' social science, technological might, and institutional models—reified in monolithic ways—seem to have failed, local knowledge and technology—reified as 'indigenous'—are often viewed as the latest and the best strategy in the old fight against hunger, poverty and underdevelopment (Atte, 1992; Richards, 1985; Scoones et al., 1992; Tjahjadi, 1993). Because indigenous knowledge has permitted its holders to exist in 'harmony' with nature, allowing them to use it sustainably, it is seen as especially pivotal in discussions of sustainable resource use (Anderson and Grove, 1987; Compton, 1989; Flora and Flora, 1989; Ghai and Vivian, 1992; Inglis, 1993; Moock, 1992; Sen, 1992).

In the 1950s and 1960s, theorists of development saw indigenous and traditional knowledge as inefficient, inferior, and an obstacle to development. Current formulations about indigenous knowledge, however, recognize that derogatory characterizations of the knowledge of the poor

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and the marginalized populations may be hasty and naive. In reaction against Modernization Theorists and Marxists, advocates of indigenous knowledge underscore the promise it holds for agricultural production systems and sustainable development (Altieri, 1987; Brokensha, Warren and Werner, 1980; Chambers, Pacey and Thrupp, 1989; Gliessman, 1981; Gupta, 1990, 1992; Moock and Rhoades, 1992; Niamir, 1990; Rhoades and Booth, 1982; Warner, 1991; Warren, 1991; Warren, Slikkerveer and Brokensha, 1991; Warren, Slikkerveer and Titilola, 1989).

The focus on indigenous knowledge and production systems heralds a long overdue move. It represents a shift from the preoccupation with the centralized, technically oriented solutions of the past decades that failed to alter life prospects for a majority of the peasants and small farmers in the world. By highlighting the possible contributions of the knowledge possessed by the marginalized poor, current writings force attention and resources towards those who most need them. But although the advocates of indigenous knowledge have appropriately tried to focus concern on indigenous and marginalized populations by highlighting their knowledge, their work suffers from contradictions and conceptual weaknesses. This article, even as it recognizes the positive contributions of indigenous knowledge theorists, questions the divide between indigenous and western knowledges that seduces modernization[1] and indigenous theorists alike.

I first present some of the reasons that seem responsible for the current surge of interest in indigenous knowledge, and go on in the following section to describe how advocates of indigenous knowledge have tried to valorize it. Using contradictions harboured in their writings, the third section questions the validity, even the possibility, of separating traditional or indigenous knowledge from western or rational/scientific knowledge. Taking Levi-Strauss as an exemplar, I suggest that the contradictions in contemporary writings about indigenous knowledge echo those in earlier attempts of anthropologists to study 'savage minds' and 'primitive cultures'. The critique implicitly indicates possible directions to engage these issues more productively. The final section elaborates these directions in greater detail.

It is necessary to clarify two points at the outset. For the most part the paper will employ terms such as indigenous, local, primitive, savage, or western, rational, scientific, modern, and civilized, without the use of quotation marks. These terms remain, however, deeply problematic. I use them without a simultaneous textual indication of their questionable nature only to prevent awkwardness and promote fluency in reading. Further, without conceding that these sets of terms mean the same things, I deploy them almost interchangeably, as is usually done in the literature I am engaging. Second, I will refer, again primarily for convenience, to the

1. See Berman (1988) for the relationship between Marx and modernity.

advocates of indigenous knowledge as '*neo-indigenistas*', and the belief that indigenous knowledge has something of value to offer as '*neo-indigenismo*'. Since the paper regularly and frequently alludes to the advocates of indigenous knowledge, a simpler term to denote them and their advocacy proves convenient.[2]

THE RISE OF INDIGENOUS KNOWLEDGE

Evidence for the allure which indigenous knowledge holds for theorists and practitioners alike lies in multiple arenas. New international and national institutions sponsor inquiries into indigenous knowledge. Funding agencies attempt to incorporate issues related to indigenous knowledge in their financial activities (CIDA, IDRC, UNESCO and the World Bank come to mind as examples). Newsletters, journals and other mouthpieces emphasize the significance of indigenous knowledge. In numerous conferences, scholars and development professionals discuss the merits of indigenous knowledge and deploy a new populist rhetoric to assert the relevance of indigenous knowledge in development. As Warren et al. (1993: 2) underline:

> Ten years ago, most of the academics working in the area of indigenous knowledge represented anthropology, development sociology, and geography. Today ... important contributions are also being made in the fields of ecology, soil science, veterinary medicine, forestry, human health, aquatic science, management, botany, zoology, agronomy, agricultural economics, rural sociology, mathematics, ... fisheries, range management, information science, wildlife management, and water resource management.

Indigenous knowledge forms the capstone of several convergent trends in social science thinking and development administration practice. In the past few years, with the failure of the grand theories of development, the focus in most of the social sciences has altered to favour middle-range theories that are site- and time-specific. At the same time, the agency of the subaltern actors, against the manipulative strategies of élites, has regained a significant place (Abu-Lughod, 1990; Colburn, 1989; Scott, 1985, 1986). It is becoming *de rigeur* to consider not just how the poor and the marginalized are subjected to development, but also the manner in which they are able to withstand and reappropriate external interventions creatively (Pigg, 1992). Without the lack of fit between 'universalist' theories of development and local social/economic/ideological systems; without resistance, and creative reappropriation, how can one begin to explain the failure of five decades of state-sponsored development? As each of these trends in the social sciences

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2. The terms '*indigenistas*' and '*indigenismo*' possess historically-situated connotations in the Latin American context that render their use somewhat problematic. The terms I use, *neo-indigenistas* and *neo-indigenismo*, do not attempt to draw upon these associations. I am grateful to Mark Thurner for suggesting a possible solution to this problem.

stresses the agency of the local, *indigenismo* becomes a more acceptable alternative.

At the same time, the science of development studies seems to be in disarray. The most prominent actor in development, the state, is in full retreat in most third world countries. The temper of the times is perhaps best illustrated by the significant role being accorded to the NGOs—they collectively channel more development aid to the South than the World Bank and the IMF put together (Brett, 1993; Cernea, 1988; Clark, 1991; OECD, 1988). The relative failure of externally introduced development initiatives has impelled a shift toward a participatory and decentralized motif in development. Insofar as the populist rhetoric of indigenous knowledge also emphasizes the capacities of the underprivileged, the local, and the under-represented, and stresses the need to secure the participation of indigenous and local groups, it fits in admirably with emergent themes in development studies and administration. Finally, the rhetoric of indigenous knowledge also appeals because although *neo-indigenistas* often talk about 'empowering' marginalized groups, they seldom emphasize that significant shifts in existing power relationships are crucial to development.

WHAT IS NEW ABOUT 'INDIGENOUS KNOWLEDGE'?

In the positive clamour that has hailed the emergence of this youngest sibling of 'economic growth', 'growth with equity', 'appropriate technology', 'participatory development', and 'sustainable development', one may miss the forest for the trees. What is new about the rhetoric and practice of indigenous knowledge? What is it that distinguishes indigenous from western knowledge? Warren outlines the following characteristics of indigenous knowledge in a paper prepared for the World Bank:

> indigenous knowledge is an important natural resource that can facilitate the development process in cost-effective, participatory, and sustainable ways (Vanek, 1989; Hansen and Erbaugh, 1987). Indigenous knowledge (IK) is local knowledge—knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision-making in agriculture, health care, food preparation, education, natural resource management, and a host of other activities in rural communities. Such knowledge is passed down from generation to generation, in many societies by word of mouth. Indigenous knowledge has value not only for the culture in which it evolves, but also for scientists and planners striving to improve conditions in rural localities. (Warren, 1991: 1)

The comments Warren makes about indigenous knowledge highlight its significance, and contrast it to western knowledge, but offer less information on the dimensions along which it actually differs from western knowledge. The primary dimension of difference and uniqueness, according to Warren, seems to lie in an organic relationship between the local community and its

knowledge. Indigenous knowledge, therefore, is of crucial significance if one wishes to introduce a cost-effective, participatory and sustainable development process.

In an earlier paper Warren cites Chambers (1980: 2) to provide a better explication of the distinction between indigenous and western knowledge:

> Modern scientific knowledge is centralized and associated with the machinery of the state; and those who are its bearers believe in its superiority. Indigenous technical knowledge, in contrast, is scattered and associated with low prestige rural life; even those who are its bearers may believe it to be inferior. (Warren, 1989: 162)

Howes and Chambers, referring to indigenous knowledge as indigenous technical knowledge (ITK), prefer to differentiate it from scientific knowledge on methodological, rather than substantive grounds—a discussion that recalls and reproduces the dimensions highlighted by Levi-Strauss in his two books, *Totemism* and *The Savage Mind.* Howes and Chambers say:

> An important difference between science and ITK lies in the way in which phenomena are observed and ordered. The scientific mode of thought is characterized by a greater ability to break down data presented to the senses and to reassemble it in different ways. The mode of ITK, on the other hand, is 'concrete' and relies almost exclusively on intuition and evidence directly available to the senses.
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> A second distinction derives from the way practitioners to the two modes of thought represent to themselves the nature of the enterprise in which they are engaged. Science is an open system whose adherents are always aware of the possibility of alternative perspectives to those adopted to any particular point of time. ITK, on the other hand, as a closed system, is characterized by a lack of awareness that there may be other ways of regarding the world. (Howes and Chambers, 1980: 330)

While they go on to downplay the first difference, they lay special emphasis on the suggestion that ITK changes only to solve minor puzzles—analogous to the kind of changes that Kuhn (1962) talked about and which are supposed to occur in the course of 'normal' science.[3] But ITK is still, allegedly, different from science because the latter 'constantly carries with it the possibility of "revolutionary change" in which one paradigm would be destroyed by another' (Howes and Chambers, 1980: 330).

Some researchers have attempted to distinguish indigenous knowledge by claiming that women have particularly rich insights in many indigenous cultures and local knowledge systems (Thrupp, 1989: 140).[4] However,

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3. See, however, Toulmin (1970), Watkins (1970) and Williams (1970) for doubts about the distinction between the idea of 'normal' vs. 'revolutionary' science. Further, indigenous farmers and producers have also demonstrated their capacity for the so-called revolutionary changes in practice and worldviews (Richards, 1985).
4. For a similar attempt to accord women a privileged status in indigenous systems, or to equate them with a 'natural' nature, see Shiva (1988).

attempts to conjoin indigenous knowledge systems with women's ways of knowing are unsustainable for at least two reasons. In all cultures and for all knowledge systems women may possess particularly rich insights about some aspects of their culture. Therefore, the existence of knowledgeable women in local knowledge systems can scarcely be a distinguishing feature of these systems. Secondly, numerous indigenous cultures discriminate against women possessing knowledge that members of the culture value. For example, among the *Bororo* of Brazil, whom Levi-Strauss describes, or among the *Sawos* and the *Iatmul* of Papua, women are strictly prohibited from entering men's communal houses or even viewing sacred objects.

Dei defines indigenous knowledge as the 'common sense knowledge and ideas of local peoples about the everyday realities of living':

> It [indigenous knowledge] includes the cultural traditions, values, beliefs, and worldviews of local peoples as distinguished from Western scientific knowledge. Such local knowledge is the product of indigenous peoples' direct experience of the workings of nature and its relationship with the social world. It is also a holistic and inclusive form of knowledge. (Dei, 1993: 105)

The writings mentioned here provide an indication of the distinctions *neo-indigenistas* draw between indigenous and western knowledge. A more comprehensive discussion of differences is available in Banuri and Apffel-Marglin (1993), based on an earlier volume by Apffel-Marglin and Marglin (1990). Using a 'systems of knowledge' framework, they find the distinguishing characteristics of indigenous knowledge (which they call traditional knowledge) to be situated in the facts that: 1) it is embedded in its particular community; 2) it is contextually bound; 3) it does not believe in individualist values; 4) it does not create a subject/object dichotomy; and 5) it requires a commitment to the local context, unlike western knowledge which values mobility and weakens local roots (Banuri and Apfell-Marglin, 1993: 10–18).

The major themes that presumably separate indigenous from western knowledge can be now summarized. We must consider three chief dimensions: 1) substantive—there are differences in the subject matter and characteristics of indigenous vs. western knowledge; 2) methodological and epistemological—the two forms of knowledge employ different methods to investigate reality, and possess different world-views; and 3) contextual—traditional and western knowledge differ because traditional knowledge is more deeply rooted in its context.

Armed with the alleged distinctions between indigenous and scientific knowledge *neo-indigenistas* propose a simple strategy, and a seemingly convincing array of reasons to guarantee indigenous knowledge a place in the political arena of development. They all agree that successful development strategies must incorporate indigenous knowledge into development planning. Brokensha, Warren and Werner, in their first major

work on indigenous knowledge[5] explain the necessity of using it (indigenous knowledge) for development:

> 'Development from below' is for many reasons, a more productive approach than that from above, and ... an essential ingredient is indigenous knowledge ... To incorporate in developmental planning indigenous knowledge: is a courtesy to the people concerned; is an essential first step to successful development; emphasizes human needs and resources, rather than material ones alone; makes possible the adaptation of technology to local needs; is the most efficient way of using western 'Research and Development' in developing countries; preserves valuable local knowledge; encourages community self-diagnosis and heightens awareness; leads to a healthy local pride; can use local skills in monitoring and early warning systems; involves the users in feedback systems, for example, on crop varieties.
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> These positive reasons—together with the negative reasons, such as the likelihood of failure without using indigenous knowledge—constitute a strong case for incorporating this knowledge in development programs (Brokensha et al., 1980: 7–8).

But two questions still remain. Why should academics, development professionals, and governments, who shunted aside indigenous knowledge for five decades of planned development, start using it now? And even were they to become persuaded that indigenous knowledge is valuable, how can they gain it? A straightforward answer to the first question is available in the *Indigenous Knowledge and Development Monitor*—'a publication of and for the international community of people who are interested in indigenous knowledge'.[6] According to the editorial in this journal, just as scientific knowledge is gathered, documented and disseminated in a coherent and systematic fashion, so too should indigenous knowledge be handled. As more case studies explain the utility of indigenous knowledge, its relevance to development planning will become self-evident. In light of the failure of development strategies that have hitherto been used, and the demonstrated utility of indigenous knowledge, only the most obtuse will refuse it a place in planned development.

To answer the second question, *neo-indigenistas* suggest these new studies on indigenous knowledge should be archived in national and international

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5. According to these authors, their edited volume may also have been the first collection that explicitly examined the relationship between indigenous knowledge and development in a comprehensive way.
6. The *Indigenous Knowledge and Development Monitor* is produced by three major international centres on indigenous knowledge: CIRAN—the Centre for International Research and Advisory Networks in the Netherlands; CIKARD—the Centre for Indigenous Knowledge for Agricultural and Rural Development in Iowa, United States; and LEAD—the Leiden Ethnosystems and Development Program in the Netherlands. These international centres assist and network the activities of regional and national centres in Nigeria (ARCIK), Philippines (REPPIKA), Brazil, Burkina Faso, Ghana, Kenya, Indonesia, Mexico, South Africa, Uruguay and Venezuela. The editorial board of the publication comprises D. Warren, G. Von Liebenstein, L. Slikkerveer, D. Brokensha, J. Jiggins and C. Reij—all of whom are well known theorists and advocates of indigenous knowledge.

centres as databases. The information in these databases could be classified according to different topics and subjects. The collection and storage of indigenous knowledge in archives should be supplemented with adequate dissemination and exchange among interested parties using newsletters, journals and different networks (Warren et al., 1993: 1). These ideas seem an elaboration of the sentiments expressed by Brokensha, Warren and Werner more than a decade ago: 'We would like to envisage an increasing awareness and systematic use of indigenous knowledge systems. Eventually, there should be national archives of such knowledge ... Such archives could be used both by nationals and by foreigners' (Brokensha et al., 1980: 8).[7]

In accenting the importance of indigenous knowledge, however, *neo-indigenistas* are caught on the horns of a dilemma. On the one hand their focus on indigenous knowledge has successfully gained them an audible presence in the chorus of development. At the same time, talking about indigenous knowledge commits them to the dichotomy between indigenous and western knowledge—a dichotomy that many earlier anthropologists, including Malinowski, Boas, Levi-Bruhl, Mauss, Evans-Pritchard, Horton, and Levi-Strauss—could not leave alone (Geertz, 1983: 148). The arguments of *neo-indigenistas* today reproduce the dilemmas of earlier debates. In dazzling analyses of primitive and modern cultures and systems of knowledge, Levi-Strauss, for example, defended with virtuosity the claim that different systems to classify knowledge share many similarities (1962, 1966). But at the same time, his work anticipated the arguments of the *neo-indigenistas* in pinpointing differences. Primitive cultures (he suggested) are more embedded in their environments; primitive peoples are less prone to analytic reasoning that might question the foundations of their knowledge; primitive thought systems are more closed than scientific modes of thought, and thus less subject to change in the face of contrary evidence. Unfortunately, neither Levi-Strauss's arguments, nor those of the *neo-indigenistas* can be sustained.

THE LOGIC OF INDIGENOUS KNOWLEDGE: OLD WINE IN OLD BOTTLES?

A number of inconsistencies and problems mark the assertions from the *neo-indigenistas*. Their case seems superficially persuasive. Indigenous knowledge and peoples, the argument goes, are disappearing all over the world as a direct result of the pressures of modernization. Their disappearance, in turn, constitutes an enormous loss to humanity since they possess the potential to remedy many of the problems that have emasculated development strategies during the past five decades. Greater efforts must, therefore, be made to save, document and apply indigenous strategies of survival.

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7. See also Ulluwishewa (1993).

But *neo-indigenistas* remain committed to the same kind of dichotomous classification that dominated the world view of the modernization theorists,[8] in spite of their seeming opposition to the idea that indigenous institutions and knowledge are obstacles to the march by the Angel of Progress. Both groups of theorists seek to create two categories of knowledge — western and indigenous — relying on the possibility that a finite and small number of characteristics can define the elements contained within the categories. This attempt is bound to fail because different indigenous and western knowledges possess specific histories, particular burdens from the past, and distinctive patterns of change. Colin MacCabe (1988: xvii) puts it: 'any one world is always, also, a radical heterogeneity which radiates out in a tissue of differences that undoes the initial identity'.

Western knowledge is supposedly guided by empirical measurements and abstract principles that help order the measured observations to facilitate the testing of hypotheses. Yet, by what yardstick of common measure can one club together the knowledges generated by such western philosophers as Hume and Foucault, Derrida and Von Neumann, or Said and Fogel?[9] And by what tortuous stretch of imagination would one assert similarities between the Azande beliefs in witchcraft (Evans-Pritchard, 1936), and the decision-making strategies of the *Raika* shepherds in western India (Agrawal, 1993, 1994), or between the beliefs among different cultures on intersexuality (Geertz, 1983: 80–4), and the marketing activities in traditional peasant communities (Bates, 1981; Schwimmer, 1979)? Thus, on the one hand we find striking differences among philosophies and knowledges commonly viewed as indigenous, or western. On the other hand we may also discover that elements separated by this artificial divide share substantial similarities, as, for example, agroforestry, and the multiple tree cropping systems of small-holders in many parts of the world (Rocheleau, 1987; Thrupp, 1985, 1989); agronomy, and the indigenous techniques for domestication of crops (Reed, 1977; Rhoades, 1987, 1989); taxonomy, and the plant classifications of the Hanunoo or the potato classifications of the Peruvian farmers (Brush, 1980; Conklin, 1957); or rituals surrounding football games in the United States, and, to use a much abused example, the Balinese cockfight.

A classification of knowledge into indigenous and western is bound to fail not just because of the heterogeneity among the elements — the knowledges

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8. The attitudes of social scientists during the 1950s and the 1960s may have been no more than a continuation of the negative values and attitudes towards indigenous peoples and knowledge systems that date from the beginnings of the European exploration of the world. Warren (1989) outlines some of the legacies of nineteenth century social science for the attitudes towards indigenous knowledge in the 1950s and 1960s.
9. As Feyerabend (1975) asserts, 'the views of scientists and especially their views on basic matters are often as different from each other as are the ideologies of different cultures' (1993 reprint: xi–xii).

filling the boxes marked indigenous or western. It also founders at another, possibly more fundamental level. It seeks to separate and fix in time and space (separate as independent, and fix as stationary and unchanging) systems that can never be thus separated or so fixed. Such an attempt at separation requires the two forms of knowledge to have totally divorced historical sequences of change — a condition which the evidence simply does not bear out. According to Levi-Strauss, contact and exchange among different cultures, including between Asia and the Americas, was a fact of life from as early as thousands of years ago (1955: 253–60). Certainly, what is today known and classified as indigenous knowledge has been in intimate interaction with western knowledge since at least the fifteenth century (Abu-Lughod, 1987–88, 1989; Eckholm, 1980; Schneider, 1977; Wallerstein, 1974, 1979a, 1979b; Wolf, 1982). In the face of evidence that suggests contact, variation, transformation, exchange, communication, and learning over the last several centuries, it is difficult to adhere to a view of indigenous and western forms of knowledge being untouched by each other. As Dirks et al. remark (1994: 3), it was the 'virtual absence of historical investigation in anthropology (because of which) cultural systems have, indeed, appeared timeless, at least until ruptured by "culture contact" '.

Whether we examine their substantive, methodological, or contextual claims, *neo-indigenistas* stand on shaky ground.

Substantive Differences

Substantive differences between indigenous and western knowledge presumably lie in their subject matter and their characteristics. By some accounts, indigenous knowledge is concerned primarily with those activities that are intimately connected with the livelihoods of people rather than with abstract ideas and philosophies. Thus most writers on indigenous knowledge suggest that local populations possess highly detailed and richly complex information about agriculture, agro-forestry, pest management, soil fertilization, multiple cropping patterns, health care, food preparation and so forth. Western knowledge, in contrast, is divorced from the daily lives of people and aims at a more analytical and abstract representation of the world. Western science builds general explanations that are one step removed from concrete realities and which result in insights that can be used for problem-solving in many different contexts.

Yet there is an equally impressive number of studies, often stemming from indigenous knowledge advocates themselves, which claim that indigenous knowledge is not just about immediate technical solutions to everyday problems (Juma, 1989; Marks, 1984; Norgaard, 1984; Richards, 1985), but that it also contains 'non-technical insights, wisdom, ideas, perceptions, and innovative capabilities which pertain to ecological, biological, geographical,

or physical phenomena' (Thrupp, 1989: 139).[10] At the same time, the line divorcing western knowledge from the livelihoods of western peoples may be too blunt. There is scarcely any aspect of life in the west today that does not bear the imprint of science—above all, science is harnessed for utilitarian purposes—to the extent that it is no longer possible to make the kind of easy distinction that was routinely made between basic and applied science.

Several internal features, *neo-indigenistas* suggest, define indigenous knowledge in counterpoint to western scientific knowledge. Indigenous knowledge is scattered and institutionally diffused, it possesses only a low prestige value, even for its adherents, and in the last analysis it is the cultural heritage of indigenous peoples. Western knowledge, on the other hand, is centralized and carries high prestige, and it is the knowledge which is held by the western peoples. These claims seem overblown. It would be difficult, for example, to defend the assertion that knowledge can be the property, over a period of time, of a specific group and that it can be characterized in a particular way as a result of being the property of that group. Further, whether knowledge derives its prestige from being the property of a particular group, or from the utility it is perceived to possess is a difficult claim to arbiter. The same knowledge can possess high or low prestige, depending on who advances it, or depending on its utility. Without the possibility of such differing assessments of indigenous knowledge *neo-indigenistas* would have found it impossible to claim value for it.

Methodological and Epistemological Differences

If science cannot be distinguished from traditional knowledge on the basis of the contents or characteristics of the two categories of knowledge, the foundationalist hope[11] of some *neo-indigenistas* leads them to submit that the two may still be separated on the basis of distinct methodologies and distinguishable philosophies of knowledge (Howes and Chambers, 1980). By this account, seemingly with greater intellectual content, science is open,

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10. Levi-Strauss' influence is, again, evident. See the opening pages of *The Savage Mind*, and Geertz (1983: 87–90).
11. Foundationalism, resembling in its varied connotations other -isms such as Marxism or empiricism, is the belief that knowledge, inquiry and truth can be built on some ultimately stable ground, such as God (Augustine), the material world (Marx), logic (Hempel), or a neutral observation language (Chomsky). Perhaps the first significant, and certainly the best-known, anti-foundationalist was Nietzsche. According to Connolly (1993: 11, 12): 'Nietzsche is to modernity as the madman is to the marketplace' as he hunts down the modern faith in theories of truth, individuality, morality, language, sovereignty, community and the common good. For an accessible discussion of anti-foundationalism, see Fish (1989), and the volume edited by Mitchell (1985).

systematic, objective and analytical, and advances by building rigorously on previous achievements. What scientists do is supposed to be strictly separable from common sense or non-science. Indigenous knowledge, in contrast, is no more than common sense; it is closed, non-systematic, without concepts that would conform to ideas of objectivity or rigorous analysis, and advances, if at all, in fits and starts.

In advancing this claim, *neo-indigenistas* seem to have advanced little beyond Levi-Strauss. In an enduring image dividing science from the knowledge systems of the primitives, Levi-Strauss described the difference between the engineer and the *bricoleur*. In *The Savage Mind*, he suggested that the main difference lay in the capacity of the engineer to 'go beyond the constraints imposed by a particular state of civilization while the "bricoleur" by inclination or necessity always remains within them' (Levi-Strauss, 1966: 19). One might ask Levi-Strauss how the *bricoleur*'s culture changes if he is unable or disinclined to move beyond the resources that his civilization makes available. Or, perhaps, it might be correct to presume that the knowledge systems of savages, produced *sui generis*, are locked into a stasis that precludes all change beyond repetitious recombination of the same elements?

But it is, perhaps, unnecessary to tediously investigate the limitations of such a claim, constituting, as it were, a reinvention of the wheel. Philosophers of science have abandoned any serious hope for a satisfactory methodology to distinguish science from non-science. From the collapse of Bacon's recipe for the advancement of learning, to the failure of the logical positivists of the Vienna School in the first half of the twentieth century to find verification criteria, to the demise of Popper's and Lakatos's demarcation principles—the history of attempts to delineate scientific methodologies is littered with ruins (Kulka, 1977). Even the more ardent supporters of a separation between science and non-science are reduced to what Stanley Fish (1989: 322) has called 'theory hope'. They suggest that while methodologies proposed to date have not been successful in separating science from non-science, this 'by no means precludes the possibility that a satisfactory method will eventually be found. There seems to be a general advancement in methodology, and ... I see no reason why we shouldn't expect further progress in the field' (Kulka, 1977: 279). Given the failure of numerous philosophers of science, such as Leibniz, Popper, Carnap, Grunbaum, or Lakatos, to find satisfactory demarcation criteria, it seems strange to find advocates of indigenous knowledge resuscitating improbable strawmen in the 1990s in defence of their attempts to uplift the indigenous and the local.

Feyerabend's (1975) attacks on the dogmatism and intolerance of science towards insights and methods of inquiry outside established, institutionalized science are sufficiently on target that even his avowed critics accept them (Tibbetts, 1977: 272). In such a situation it is unnecessary to aver the openness of science to attempts aimed at dislodging it. On the other hand,

the claim that indigenous knowledge systems are closed is so totalizing as to be quite incredible. Thrupp (1985, 1988, 1989) describes the range of attitudes local populations display towards new knowledge: these run the entire gamut from pride in traditional methods and rejection of new knowledges to admiration for new ideas and embarrassment about older practices. But this range of attitudes towards new and different ideas may be precisely the best way to describe the attitude of scientists towards new knowledge. How then can anyone distinguish between science and traditional knowledge, as Howes and Chambers (1980), or Horton (1970) want to do, by arguing that one is an open system and the other closed, and that one possesses a protective attitude towards established category systems and theories and the other a destructive attitude (Horton, 1970: 162–6)?

Contextuality

Indigenous knowledge, some theorists tell us, exists in close and organic harmony with the lives of the people who generated it. Modern knowledge, however, thrives on abstract formulation and exists divorced from the lives of people. For example:

> Traditional knowledge systems are embedded in the social, cultural and moral milieu of their particular community. In other words, actions or thoughts are perceived to have social, political, moral and cosmological implications, rather than possessing only, say, a purely technological dimension ... By contrast, the modern system of knowledge seeks to distinguish very clearly between these different dimensions. Technical questions pertain to cause-and-effect relationships in the natural environment, and can coexist with many different social, moral, political or cosmological contexts. ...
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> Unlike modern knowledge, which bases its claim to superiority on the basis of universal validity, local knowledge is bound by space and time, by contextual and moral factors. More importantly, it cannot be separated from larger moral or normative ends. In order to make knowledge universally applicable and valid it is necessary to disembed it from a larger epistemic framework which ties it to normative and social ends. ... Context is local—it anchors technical knowledge to a particular social group living in a particular setting at a particular time (Banuri and Apfell-Marglin, 1993: 11, 13).

Such a rhetorical differentiation fails sustained interrogation. First, an empirical datum. One of the most devastating critiques of the technical solutions that oriented development policies over the last five decades has been that they ignored the social, political and cultural contexts in which they were implemented. But if attempts to implement western technically oriented solutions failed because they did not recognize the imperatives which different socio-political-cultural contexts entailed, it is likely that the so-called technical solutions are just as firmly anchored in a specific milieu as any other system of knowledge. More generally, nothing even makes sense without at least an imaginable context. The only choice one possesses about context is which context to highlight. This choice exists whether one talks about indigenous or modern knowledge systems. Indeed, when scholars

such as Brokensha, Gupta, Warren or Ulluwishewa talk about how the indigenous knowledge of one group of people can be useful to another people, they are talking of nothing other than finding a new context for traditional knowledge.

As contemporary philosophers of science attempt to understand what scientists do, even posing the question whether science is context-independent may seem ingenuous. Foundationalist thought has been in disarray at least since the arguments advanced by Kuhn (1962) and later, with the emergence of the sociology of scientific knowledge (SSK) in the 1970s (Barnes and Bloor, 1982; Knorr Cetina, 1981; Latour and Woolgar, 1979).[12] These perspectives focused on the social moorings of science and in so doing questioned the stock appreciations of science as objective and rational. More recent accounts emphasize scientific practice and the context upon which scientists draw to create scientific products: instruments, facts, phenomena and interpretations.[13] This view of science as practice and culture, by insisting on the 'multiplicity, patchiness and heterogeneity of the space in which scientists work' (Pickering, 1992: 8), successfully goes beyond not just earlier epistemologies rooted in rationalism, but also the later reductive representations that saw science 'as relative to culture (Kuhn, Feyerabend), (or) as relative to interests (SSK)' (ibid: 7). The discursive space thus purchased can form a valuable resource to highlight the culture and practices of scientists, and therefore provide a valuable resource for *neo-indigenistas* to build epistemic foundations.

Advocates of science as practice and culture have constructed several accounts of scientific practice (Gooding, 1992; Hacking, 1983, 1992; Knorr Cetina, 1992; Pickering and Stephanides, 1992). Studies of the manner in which farmers and other local groups experiment and innovate by combining their existing knowledge with new information are also beginning to appear and can fill a very significant gap in facilitating new approaches to indigenous knowledge (Chandler, 1991; Dvorak, 1992; Fujisaka, 1992; Sperling, 1992; Voss, 1992). Many of these studies still suffer from the commitment to the indigenous/scientific divide, and few of them study experimentation in rural settings over any length of time, but they can form the beginnings of an approach focused on indigenous practice.

As we examine specific forms of investigation and knowledge creation in different nations and different groups of people, we can allow for the existence of diversity in what is commonly seen as western or indigenous; yet

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12. This cursory review of the sociology of scientific knowledge, and science as practice and culture, is heavily indebted to Andrew Pickering's introduction to his 1992 work, *Science as practice and culture*.

13. Social theories that emphasize practice can, of course, claim an illustrious pedigree. Long before the adherents of 'science as practice and culture' arrived on the scene, Marx, Weber, Gramsci, Sartre, and more recently Bourdieu, have emphasized the significance of praxis.

our examinations can find common links in the insistent attention to the ways in which 'indigenous' or 'western' scientists create knowledge. Instead of trying to conflate all non-western knowledge into a category termed 'indigenous', and all western knowledge into another category, it may be more sensible to accept differences within these categories and perhaps find similarities across them.

Nor does 'science as practice' open the doors to the academic neuroses regarding radical subjectivism. All abstractions about different kinds of knowledges, ultimately, must submit to assessments and undergo a process of validation by a community of peers. Fears of relativism are prompted more by perceived dangers to academic turfs than any 'real' relativist threat.[14] At any rate, the possibilities of a 'genuine synthesis' in studying different forms of knowledge that science as practice opens up are real and valuable. They certainly seem more attractive than the scant offerings from the 'politics of derogation'[15] that the sterile dichotomy between the 'modern' and the 'indigenous' prompts.

CAN THE INDIGENOUS BE SAVED AS WESTERN? POURING NEW WINE IN OLD BOTTLES

The claim by the *neo-indigenistas* that the indigenous and the western are separate leads to contradictions and advocacy of contradictory practices. *Neo-indigenistas* commit themselves to the conservation of indigenous knowledge in asserting that: 1) indigenous knowledge has been undervalued and is fast disappearing; 2) it possesses much deontological significance and utilitarian value; and 3) it can be a pivotal resource in the pursuit of development worldwide.

The modalities of preservation that *neo-indigenistas* espouse, and the political implications of their suggestions, are worth greater notice. They grant priority to the preservation of knowledge, because they believe in its utilitarian value in furthering development. The prime strategy they advance is isolation, documentation, and storage of indigenous knowledge in international, regional and national archives; and its dissemination to other contexts and spaces—a strategy they believe western science has used with great effect (Serrano et al., 1993: 5–6; Ulluwishewa, 1993: 11–3; Warren, 1989: 167–8; Warren, von Liebenstein and Slikkerveer, 1993: 2–4). It is not coincidental that the strategy they espouse—*ex situ* preservation—is technically the easiest, and politically the most convenient.

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14. See, for an elaboration, Geertz (1984).
15. By 'politics of derogation' I refer to the attempts by modernization theorists and Marxists to deny validity to the knowledge and values of indigenous peoples; and the attempts by theorists of indigenous knowledge to downplay science.

To use an example, Ulluwishewa justifies the creation of national indigenous knowledge resource centres on the ground that the centres can act as a 'clearinghouse',

> for collection, documentation, comparison with global knowledge systems, dissemination and utilization of indigenous knowledge; and so that indigenous knowledge can be transferred from one ecological zone to another within a country. ... (D)issemination of indigenous knowledge from one area to another is also necessary because indigenous technology useful in one part of the world may be used to solve problems faced by another society in a similar agro-ecosystem in another area. (Ulluwishewa, 1993: 12–3)

In championing international and national archives, and the storage of knowledge in these museums, *neo-indigenistas* finally demonstrate their lingering belief in system, reason, order, centralization and bureaucratization as the hallmarks that must mark solutions to the problems of 'development'. Just as Levi-Strauss felt that savage cultures could be easily understood by a man endowed with 'traditionally French qualities' (1955: 101), indigenous knowledge theorists suggest that development specialists can use objective scientific methods to catalogue and preserve indigenous knowledge.

Their strategy is unconsciously, yet fatally, at complete odds with their desire to maintain distinctions between scientific and traditional knowledge. In their desire to find an elevated status for indigenous knowledge, they attempt to use the same instruments that western science uses. In so doing they undermine their own assertions about the separability of indigenous from western knowledge in three ways: 1) they want to isolate, document, and store knowledge that gains its vigour as a result of being integrally linked with the lives of indigenous peoples; 2) they wish to freeze in time and space a fundamentally dynamic entity—cultural knowledge; and 3) most damning, their archives and knowledge centres privilege the scientific investigator, the scientific community, science, and bureaucratic procedures.

Neo-indigenistas insist upon the scattered and local character of all indigenous knowledge. They view western knowledge with suspicion precisely because of its origins and location in centralized institutional arrangements and because it claims to be universal and transferable to multiple arenas of action. But at the same time as they suggest that indigenous knowledge derives much of its vitality from its deep entanglement in the lives of people, they also cast it as an object that can be essentialized, captured in archives, and transferred.

While *neo-indigenistas* condemn western science for being inaccessible to local peoples, irrelevant to local needs, and non-responsive to local demands, they fail to see that they themselves are consigning indigenous knowledge to the same fate—strangulation by centralized control and management. Trapped in institutions that primarily serve functions related to storage and dissemination, what is imagined as indigenous knowledge can only stagnate, and become irrelevant over time. An international system of

archives (recall the parallel with the HRAF files in anthropology), whether or not it is successful in its stated objective of utilizing indigenous knowledge for development, will certainly require, and possibly create an international group of new development professionals, scientifically trained in the latest methods of classification, cataloguing, documentation, electronic and physical storage, and dissemination through publications. Constant attempts to update it by gathering more information and data, so as to reflect its dynamic and changing nature, will provide purpose and meaning only to a battery of élite data gatherers and analysers. The international, regional and national archives for housing indigenous knowledge are likely to divorce indigenous knowledge from the source that presumably provides it with its vigour — the people and their needs.

Because indigenous knowledge is generated in the immediate context of the livelihoods of people, it is a dynamic entity that undergoes constant modifications as the needs of the communities change. The strategy of *ex situ* conservation that *neo-indigenistas* advocate, therefore, seems particularly ill-suited to understanding indigenous knowledges. Whether we think of indigenous knowledge as cultural property that indigenous peoples possess, or more specific pieces of technical knowledge regarding plants or medicines, neither can retain over time their significance for development. Certainly, some forms of indigenous knowledge might be better stored and preserved in archives for short periods of time; without changing with the culture and social systems in which people dwell, however, it is difficult to imagine how technical, or any other form of knowledge will remain useful. Within our own lifetimes an immense variety of technical expertise has become obsolete as our culture has changed around us. Divorced in archives from their cultural context, no knowledge can maintain its vitality or vigour.

The shortcomings of *ex situ* conservation strategies, as evidenced in the context of preservation of genetic materials, may make the argument clear. Alarmed at that global destruction of biodiversity over which our civilization is currently presiding, many scientists have called for its preservation, often by storage of seeds in germplasm banks, in *ex situ* collections, and by *in situ* conservation (Brown and Briggs, 1991; Brush, 1989; Falk and Holsinger, 1991; Frankel and Soule, 1981; National Research Council, 1978). Of the different methods available, scientists have begun to increasingly view *ex situ* conservation as the least desirable because of its deficiencies in preserving genetic variety (Altieri, 1989; Altieri and Merrick, 1987; Falk, 1987, 1990; Hamilton, 1994; Wilson, 1992). When biologists recognize that *ex situ* conservation is a defective strategy to preserve physically demarcable, 'natural' entities such as seeds and plants, it seems strange that the *neo-indigenistas* advocate the same defective strategy for the preservation of knowledge — integrally linked with the lives of people, always produced in dynamic interactions among humans and between humans and nature, and constantly changing. Their advocacy

seems especially ironic because *ex situ* conservation is not just the preferred strategy of *neo-indigenistas*, it is almost always their only strategy.

Ex situ conservation, as may be imagined, is justified on the broad grounds that indigenous knowledges are a 'global patrimony'; that they should be made available to all interested individuals. According to Brokensha et al. (1980: 8), '(s)uch archives could be used both by nationals and by foreigners'. But access to centralized, bureaucratized data systems will always remain inequitable, disadvantaging the smaller users and farmers.

The ultimate irony in the writings of the *neo-indigenistas*, perhaps, has less to do with their willingness to adopt the methods and instruments of science. While they mock science for its lack of vision and inability to solve the problems of marginal regions and marginalized peoples, they also unconsciously assign it a higher pedestal. They devote much of their writing to cataloguing indigenous peoples' practice which must be saved because of the value they hold for development. However—and here again a Baconian belief in the superiority of science asserts itself—these practices must first be checked using scientific method. In a paper praising indigenous technology, Massaquoi (1993: 3) says, 'we should examine the existing technology in order to identify its weaknesses and strengths so scientific principles can be applied in effective ways to improve it'. In an article praising the ethnomedical knowledge of the *Irulas* in the Nilgiri Hills in India, Rajan and Sethuraman (1993: 20) suggest, 'The knowledge on indigenous plants and its uses ... can be harnessed for the pharmacological investigation in the modern system of medicine'. In an article that quite radically, if cursorily, downplays the distinctions between indigenous and western knowledge, Richards (1980: 184–95) contradictorily asserts the need to collect and evaluate a community's environmental knowledge on scientific grounds. Arguments betraying a similar bias can be found in Belshaw (1980), Brokensha and Riley (1980), Knight (1980), Leeflang (1993), Meehan (1980), and Moore (1980). Thus, for all the admiration and respect accorded the indigenous systems, they must first pass a scientific criterion of validity before being recognized as usable knowledge.

The *neo-indigenistas* undermine their own arguments, almost unconsciously, because of their desire to hold on to the dichotomy between indigenous/scientific, and traditional/western; and because they are unwilling to recognize the intimate links between knowledge and power. Their attempt to classify, therefore, fails to rise above the structures of knowledge that it initially condemns, and ultimately seeks to transcend. It remains mired in the rhetoric of documentation and storage, management and dissemination, centralization and bureaucratization; it ultimately authorizes science and method, dooming itself to a perpetual state of remaining, simply, a desire. Non-recognition of the relationship between knowledge and power blinkers them to the fact that their own strategy of locating the knowledge of indigenous peoples in centralized, international archives would only reproduce the control which élites exercise over scientific

knowledge. How knowledge is generated, organized, stored, and disseminated presupposes certain relationships of power and control. Ignoring these relationships will disadvantage those who do not have access to international travel, western languages, or technical expertise in computer based information storage—in short, indigenous peoples.

NEW DIRECTIONS?

If *neo-indigenistas* wish to save indigenous knowledge, they must recognize and advocate methods of conservation that engage politics. They wish to separate the indigenous from the western and promote indigenous knowledge for fairly utilitarian goals: they argue that in the pursuit of development, planners and scientists have not paid any attention to the interests of local populations, and have ignored the needs of the marginalized and oppressed groups. Development is possible only by paying attention to the knowledge and institutions of the excluded poor. Their focus on indigenous knowledge has a familiar function: using a new perspective, they attempt the development of the underdeveloped. Because the poor and the marginalized exercise some measure of control over their own knowledge, it is possible by focusing on their knowledge to find them a greater role in development. If this is a primary purpose of focusing on indigenous knowledge systems, however, it is ill-served by never making explicit the links between power and knowledge. It is this inattention to how power produces knowledge, and the acceptance of the rhetoric that 'knowledge is power', which perhaps explains the advocacy of archives for indigenous knowledge. It might be more helpful to frame the issue as one requiring modifications in political relationships that govern interactions between indigenous or marginalized populations, and élites or state formations. The confusing rhetoric of indigenous vs. western knowledge, and the reliance on the politically and technically convenient method of *ex situ* conservation fail to address the underlying asymmetries of power and control that cement in place the oppression of indigenous or other marginalized social groups. By advocating that indigenous knowledge be stored in international and national archives, available to all comers, *neo-indigenistas* only help undermine the control that the poor exercise over their knowledge.

If indigenous knowledges are disappearing, it is primarily because pressures of modernization and cultural homogenization, under the auspices of the modern nation-state and the international trade system, threaten the lifestyles, practices and cultures of nomadic populations, small agricultural producers, and indigenous peoples. Perhaps these groups are fated to disappear. But their knowledge certainly cannot be saved in an archive if they themselves disappear.

What Altieri (1989: 79) suggests about conservation of crop genetic resources—that it cannot succeed without protection of the agro-ecosystem

and the socio-cultural organization of the local people — is doubly applicable to the protection of indigenous knowledges. The appropriate response from those who are interested in preserving the diversity of different knowledges might then lie in attempting to reorient and reverse state policies and market forces to permit members of threatened populations to determine their own future, and attempt, thus, to facilitate *in situ* preservation of indigenous knowledges. *In situ* preservation cannot succeed without indigenous populations gaining control over the use of lands in which they dwell and the resources on which they rely. Those who are seen to possess knowledge must also possess the right to decide on how to save their knowledge, how to use it, and who shall use it. At the same time, it should be kept in mind that *in situ* preservation is likely to make indigenous knowledge more costly for those outsiders who wish to gain free access to it for free dissemination. The increases in costs of collecting and disseminating the local knowledge of the marginalized and indigenous would stem from their control over it, and their desire to be compensated for allowing others access to it.

Objections to such an approach are obvious. It can be claimed that: 1) indigenous populations may not be able to withstand the onslaught of modernization; 2) they do not have sufficient resources to protect their own knowledge; 3) they may give up their knowledge as it becomes more difficult to contend with an increasingly hegemonic state, market economy, or 'world culture'; 4) their knowledge is a common heritage for humanity and therefore outsiders have a right to gain access to it; or 5) *in situ* protection of their knowledge is impossible, unfeasible, or inefficient. Two simple rejoinders exist: 1) *ex situ* preservation of indigenous knowledges is likely to fail, succeeding only in creating a mausoleum for knowledge. Sundered adrift from its contextual moorings, to what extent will indigenous knowledge continue to be useful to its practitioners?; 2) *Ex situ* conservation, even if it is successful in unearthing useful information, is likely to benefit the richer, more powerful constituencies — those who possess access to international centres of knowledge preservation — thus undermining the major stated objectives of the *neo-indigenistas* — to benefit the poor, the oppressed, and the disadvantaged. Witness the appropriation of ethnobotanical knowledge by pharmaceutical and biotechnology multinationals. Knowledge freely available to all does not benefit all equally.

The mechanics of *in situ* conservation for indigenous knowledges are little understood, and will perhaps pose significant political and ethical dilemmas. Such an objection cannot, however, be an excuse for side-lining what seems more desirable. *Neo-indigenistas* must begin to grapple with such problems if they are to make their programme more acceptable to the populations whose knowledges they wish to highlight and appropriate for the common good. A beginning in this direction would be to recognize the multiplicity of logics and practices that underlie the creation and maintenance of different knowledges.

CONCLUSION

This paper began by questioning the presumed distinction between indigenous and western knowledge with two immediate consequences: one epistemological, and the other more practical. The interrogation first undermined the possibility that any piece of knowledge can be forever marked or fixed as 'indigenous' or 'western'. Indeed, I suggest that the attempt to create distinctions in terms of indigenous and western is potentially ridiculous. It makes much more sense, even from the point of view of *neo-indigenistas*, to talk about multiple domains and types of knowledges, with differing logics and epistemologies. Somewhat contradictorily, but inescapably so, the same knowledge can be classified one way or the other depending on the interests it serves, the purposes for which it is harnessed, or the manner in which it is generated.

Second, and more significantly, I argue for the recognition of a basic political truism: anchored unavoidably in institutional origins and moorings, knowledge can only be useful. But it is useful to particular peoples. Specific strategies for protecting, systematizing and disseminating knowledge will differentially benefit different social groups and individuals. The recognition of this simple truism is obscured by the confounding labels of 'indigenous' and 'western'. It is only when we move away from the sterile dichotomy between indigenous and western, when we begin to recognize intra-group differentiation; and when we seek out bridges across the constructed chasm between the traditional and the scientific, that we will initiate a productive dialogue to safeguard the interests of those who are disadvantaged.

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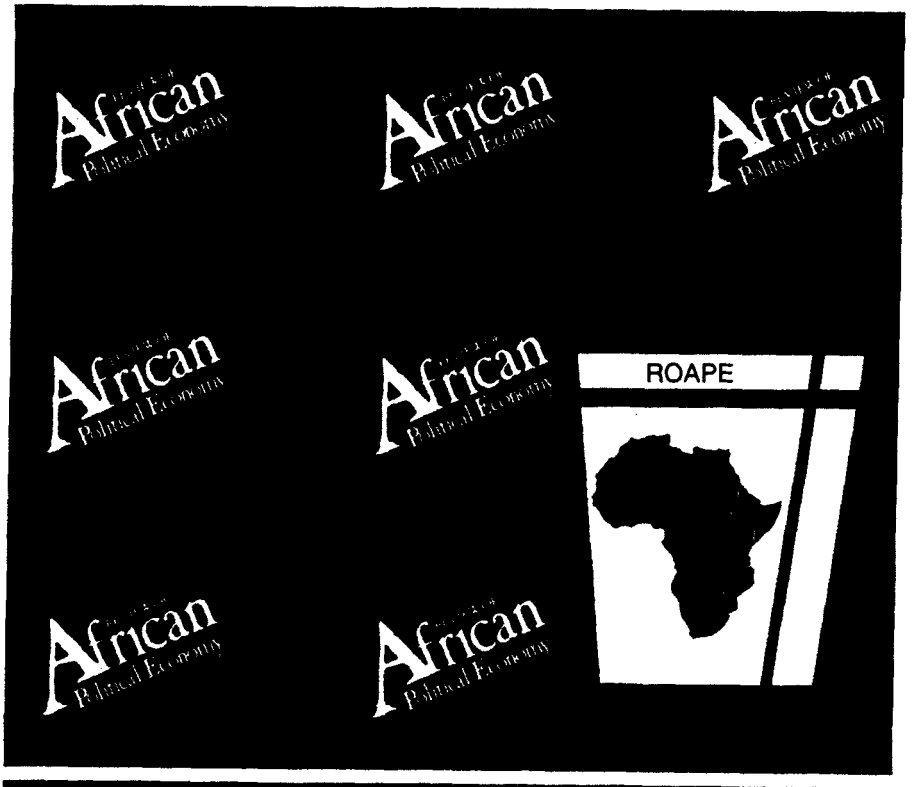

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